

Teaching Philosophy

My overall philosophy of teaching is simple: I hope to make the students that I interact with somehow richer from their experience(s) with me. A part of my role as a teacher is to facilitate the learning of factual information and key principles, however my job only begins there. When I think back to the outstanding teachers in my life that helped mold me into the person I am today, I remember those teachers that truly motivated me to reach new heights, those that stimulated my ability to think critically and to understand the subject matter on a deeper level, those that imparted their passion for learning on me, and especially those that gave a certain unquantifiable piece of themselves (can I call it love?) that in many ways transformed my intellect, my attitudes, my goals, and my life. I aspire to be this kind of a teacher. What follows here is a documentation of some of the means by which I attempt to carry out this aspiration.

I believe that learning is an active process. My role as teacher is to be a guide to this process, not merely by supplying essential information, but by providing the means to acquire knowledge independently and to utilize learned ideas in new situations. I strive to stimulate students' critical thinking skills and intellectual growth in order to set the stage for lifelong learning opportunities. Two necessary ingredients to achieve these goals are my mastery of and (perhaps more importantly) my enthusiasm for the subject matter. I endeavor to bring about similar mastery and enthusiasm among my students. While success in achieving this goal may depend on each individual student, properly motivated students do enjoy the learning process as they take an active role in it. I find that the best motivator for students is their own curiosity. The nature of the biological sciences is that one "piece of the puzzle" often provides other questions which remain unanswered. My favorite event in teaching occurs when the class subject matter leads to a student question for which I do not know the answer. I like to challenge the students to find and bring the answer back to class (and to me). In this way, comprehension of the subject matter is reinforced and more importantly, students observe that scientists (such as me) are continually seeking answers and learning.

In lectures, I utilize Powerpoint presentations to provide key factual information with accompanying illustrations. The Powerpoint slides are made available after class (and in some courses before class) via Moodle (or in the past, Blackboard). This liberates students from the need to take notes on everything that is presented (focusing less on "getting the facts"), and allows time for critical thinking, questioning, and discussion based on the information presented. Some of the background slides serve as springboards for more in-depth discussions. I try to maintain a comfortable atmosphere in the classroom to help alleviate some of their fears of class participation. In general, I seek to build a good rapport with the students, taking time to get to know each student. I can best assist them if I know their goals, values, issues, and a little about their lives. Moreover, I believe that students are more highly motivated when they sense that their professor cares about them.

In my upper level and graduate courses, we spend time reading and analyzing primary research journal articles. The ability to read the primary literature is one of our departmental learning goals and is crucial in training students to think like scientists. In accord with this goal, I require that laboratory reports (for laboratory courses) be written in a journal article format, which serves both to reinforce their understanding of primary literature and also to develop their scientific writing skills. In performance of the laboratory activities, I provide students with enough guidance to complete the required experiments and then challenge them to critically analyze their data, make conclusions, and discuss their work. There are times when the labs do not work out as planned, and students are then asked to troubleshoot and figure out what should be done differently next time. It is important that students understand that all scientists have had

failed experiments, but that good scientists will learn from these mistakes. My own research activities are an important part of my teaching as they provide an example of the scientific process in action, performed by someone that the students know. I find that students are fascinated when I present my research in class. Moreover, I have integrated my research into the curricula of the laboratory courses that I teach. In graduate courses (*e.g.*, Graduate Genetics Lab), students perform a semester long project based on my research, whereas in upper division undergraduate courses (*e.g.*, Cell Biology), students perform a series of mini-projects, again based on my research. Many of the projects performed in these laboratory exercises are novel and the students are excited to be given the opportunity to produce meaningful results. I believe that this approach, in which students perform actual experiments on a related topic throughout a semester, brings a sense of ownership to their lab experience and results in a much deeper understanding. An anonymous survey at the end of the semester for the past few years has indicated that this notion may indeed be true.

Of course, proper assessment of these and all other activities must be undertaken to ensure that the desired educational goals are being met. In designing assessment tools (notably exams, term papers and lab reports), I again attempt to challenge students to reach beyond the mere facts and to demonstrate critical thinking and a deeper understanding of the subject matter. For this purpose, I utilize predominantly essay and long answer exams, especially in the upper level and graduate courses. After the exam, I provide the answers (via Moodle) before handing back the exams (or before even posting the grades) in the hopes that students will review the exam as an added reinforcement. More recently, I have invited students to use the posted answers to remember and “grade” their exam answers in advance of receiving the actual graded exam, including of details of how and where points would be taken off. With the enticement of extra credit for this assignment, most of the class took part and I believe that this was an even better reinforcement of the material. Additionally, for all written work handed in, I try to provide constructive criticism so that students are not merely earning a grade on these assignments, but can learn how to create an even better product and gaining from the assessment process.

My experiences to date suggest that at least at some level, I am succeeding in my undertakings as teacher. However, I am well aware that there is my room for me to evolve and grow and that I can also actively learn to be a better teacher - from my colleagues and from students’ learning experiences. I believe that my goal of becoming an outstanding teacher is a journey rather than a destination. I am excited to continue on this journey.